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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kazmer et al.
Serial No. : 09/578,108
Filed : May 24, 2000
Title : PERFORMANCE-BASED REPRESENTATION FOR SUPPORT OF MULTIPLE DECISIONS

Art Unit : 2762
Examiner : Unknown

Attention: Official Draftsman
Commissioner for Patents
Washington, D.C. 20231

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TRANSMITTAL OF FORMAL DRAWINGS


Please substitute the enclosed 15 sheets of formal drawings for the corresponding drawings presently in the application.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Date: April 11, 2001


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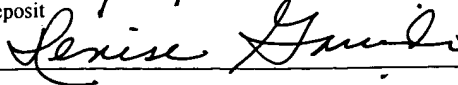
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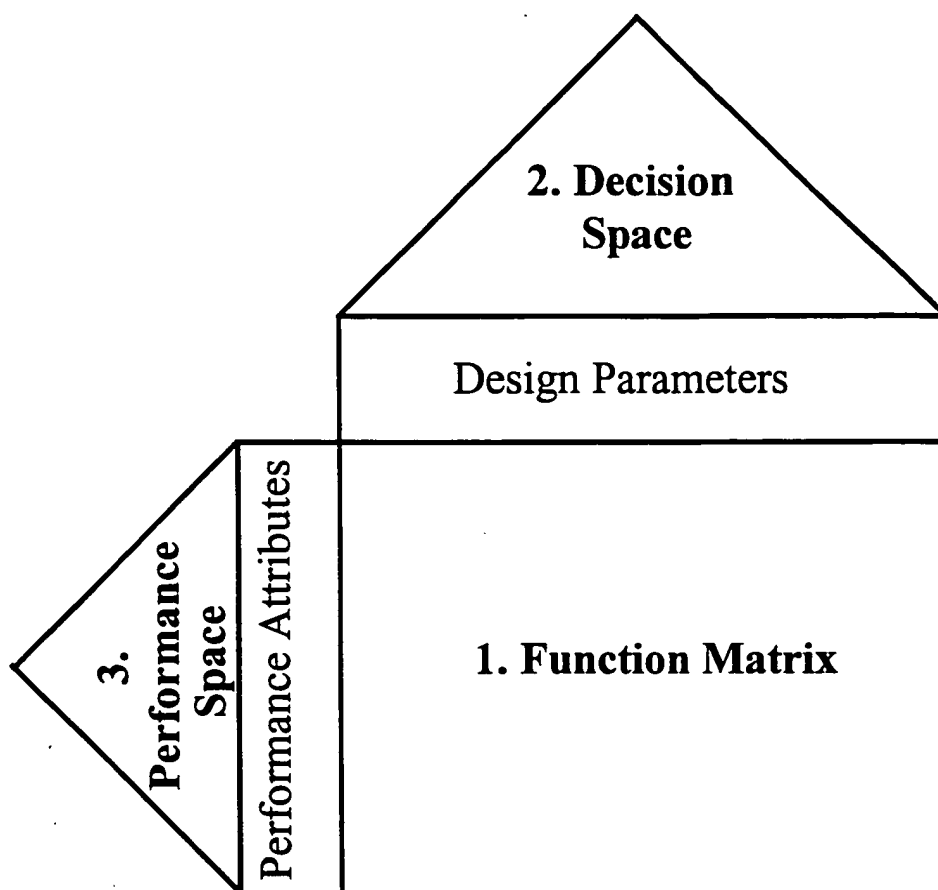


FIG. 1

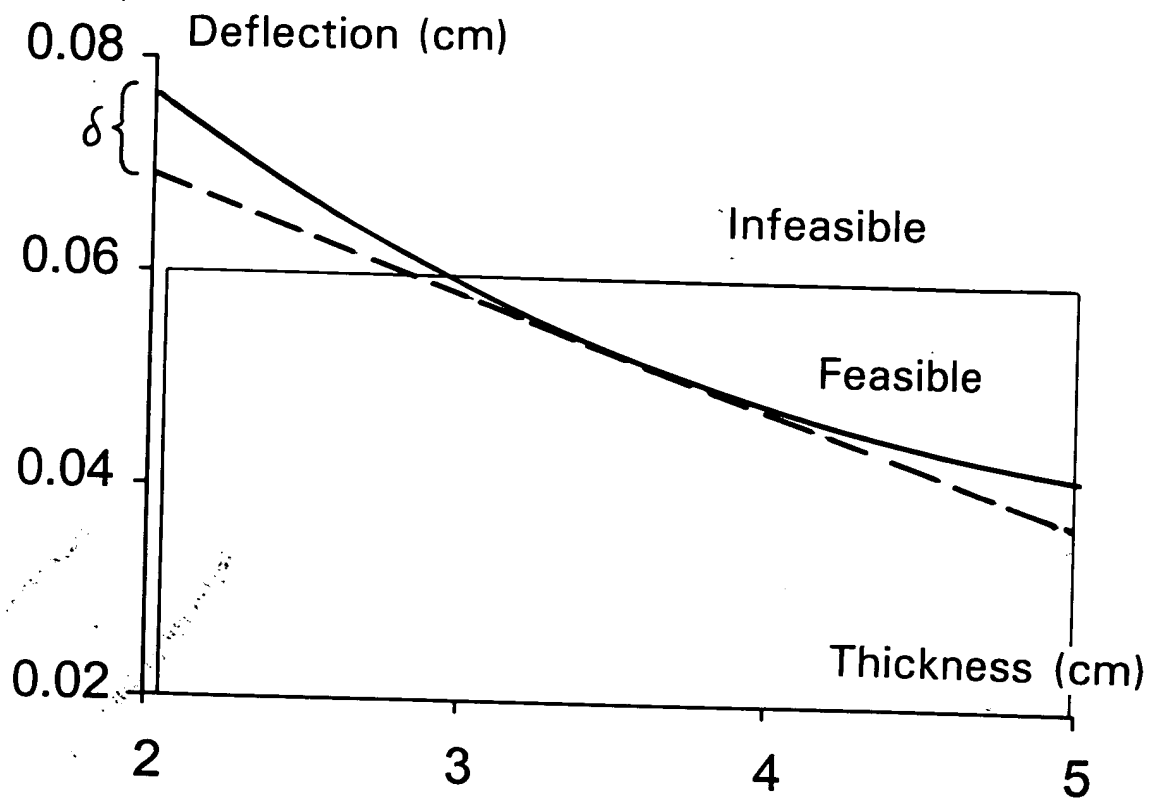


FIG. 2

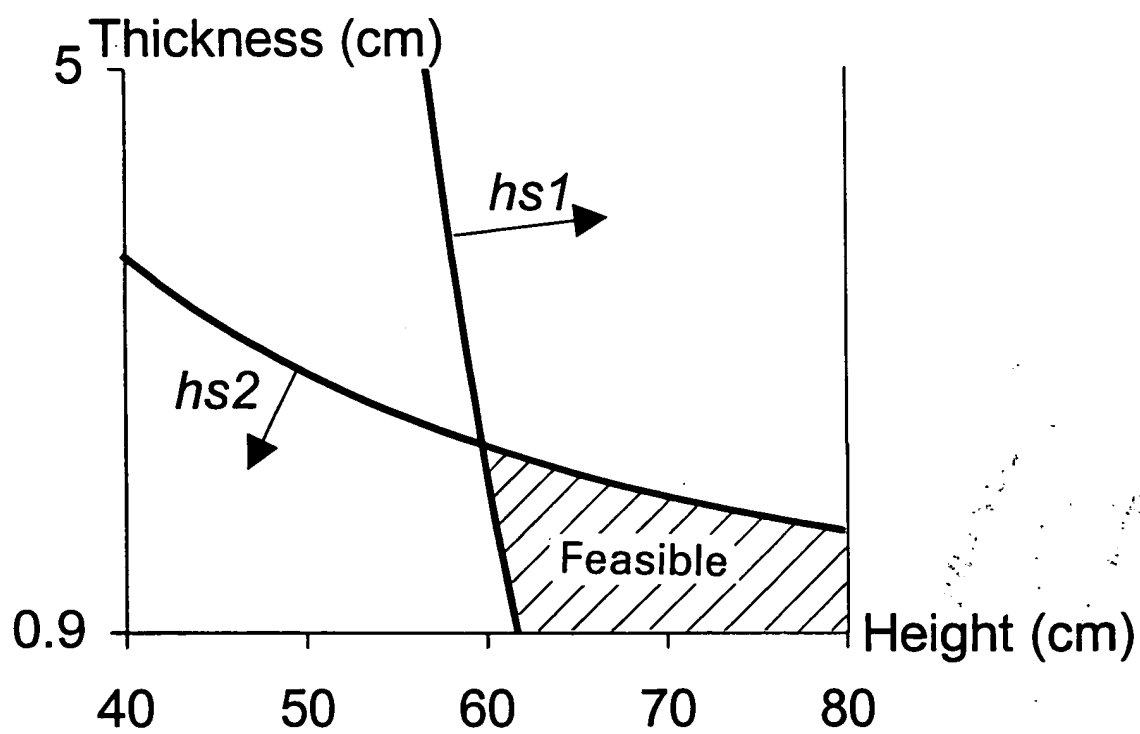


FIG. 3

1. Initialize the loop

```
lp1 = {  
    (LCLi, LCLj), (LCLi, UCLj),  
    (UCLi, UCLj), (UCLi, LCLj), (LCLi, LCLj)  
},  
k = 1.
```

2. Create the half space hs defined by the specification k :
 $hs = \{X \in R^n \mid f_k(X) \geq LSL_k\}.$

For two-side specifications, repeat Step 3~5 for USL_k .

3. Set $lp0 = lp1$,
 $v_a = v_1$, and
 $v_b = v_2$.

Empty $lp1$;

4. If both v_a and v_b are inside hs then
 add v_b into $lp1$;
 else
 if one of v_a and v_b is inside hs then
 calculate the intersection point v_c of $v_a v_b$ and hs
 add v_c into the new loop $lp1$

 if v_b is inside hs then
 add v_b into $lp1$.

5. Set $v_a = v_{a+1}$ and
 $v_b = v_{b+1}$.

If not all vertices are done, go to step 4.

6. $k = k + 1$. If $k \leq n$, go to step 2.

7. Add the first vertex into the end of $lp1$ to finish the loop. The region surrounded by $lp1$ is the feasible space of x_i vs. x_j with other parameters fixed.

FIG. 4

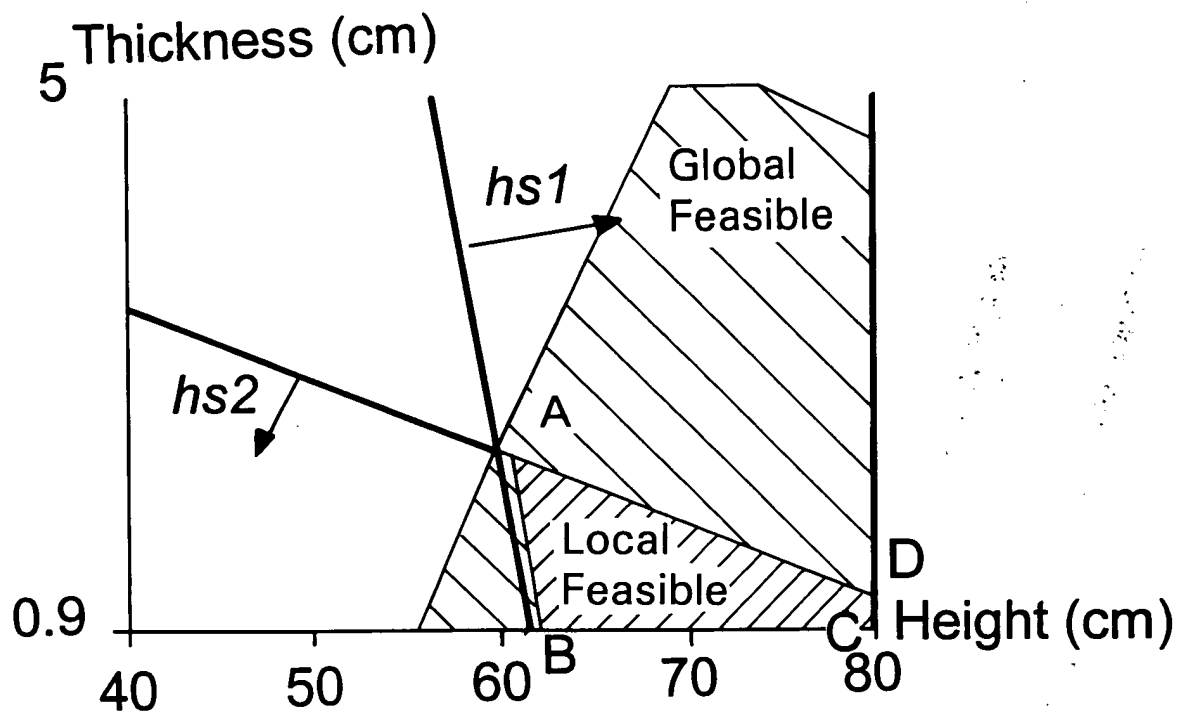


FIG. 5

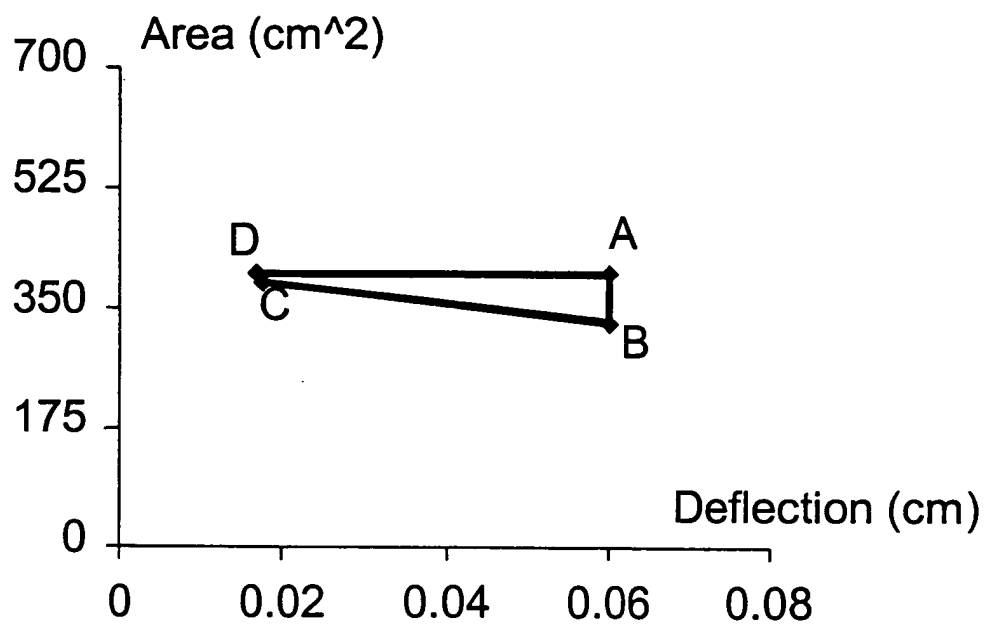


FIG. 6

1. Choose n distinctive constraints from all m specifications and n parameter limits;
2. LU decompose F into $L \cdot U$;
3. Constitute one distinctive right-side Y from specifications and parameter limits.
4. Solve $L \cdot U \cdot X = Y$ by forward and back substitution. If the solution X^* satisfies all the specifications, add it into the extreme point list.
5. If all distinct Y s have been operated upon, go to next step. Otherwise go to step 3.
6. If all distinct constraint combinations have been operated upon, go to next step. Otherwise go to step 1.
7. All extreme points and the facets are now available. The feasible decision space and performance space can be acquired by projecting the facets into each 2-dimensional viewing pane, though other projections and representations may be beneficial.
8. The boundary of the feasible space in each viewing pane is a convex hull of the extreme points. Graham-scan algorithm can be adopted to retrieve the convex boundary in $O(h \lg(h))$ time where h is the number of all vertices.

FIG. 7

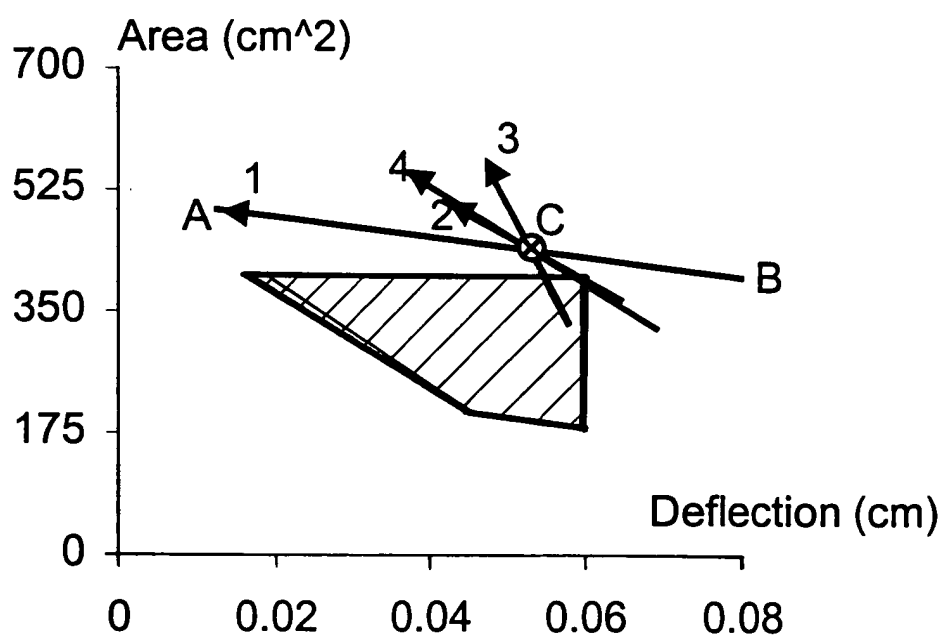


FIG. 8

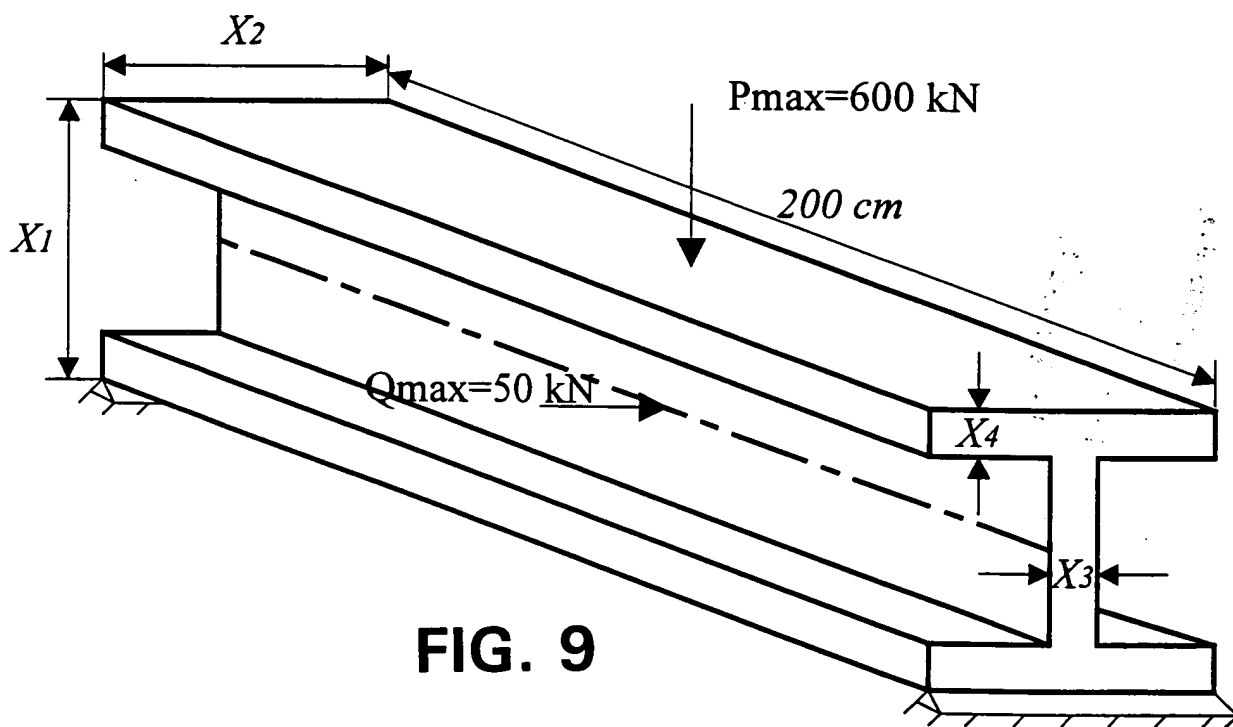


FIG. 9

FIG. 10

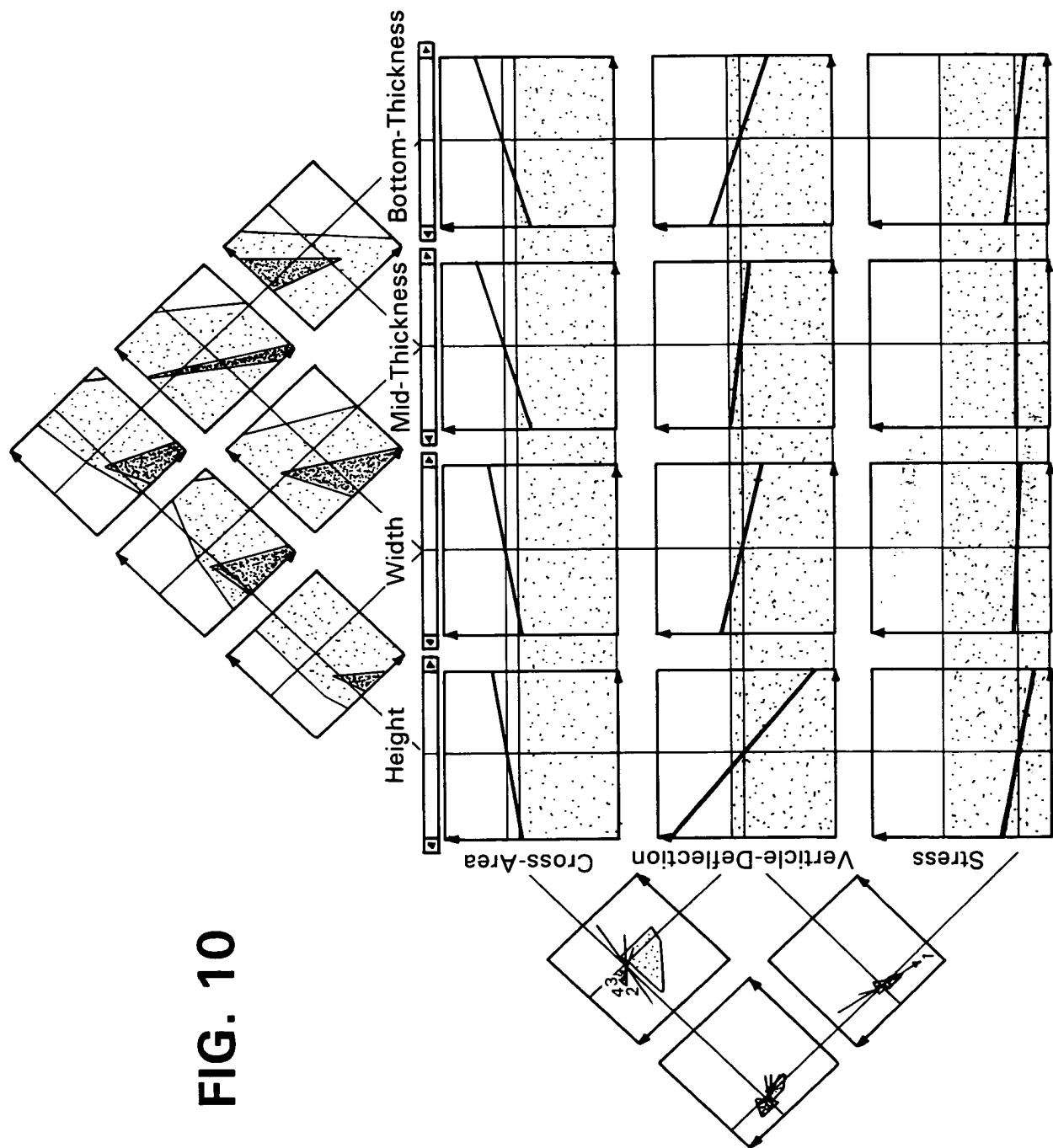
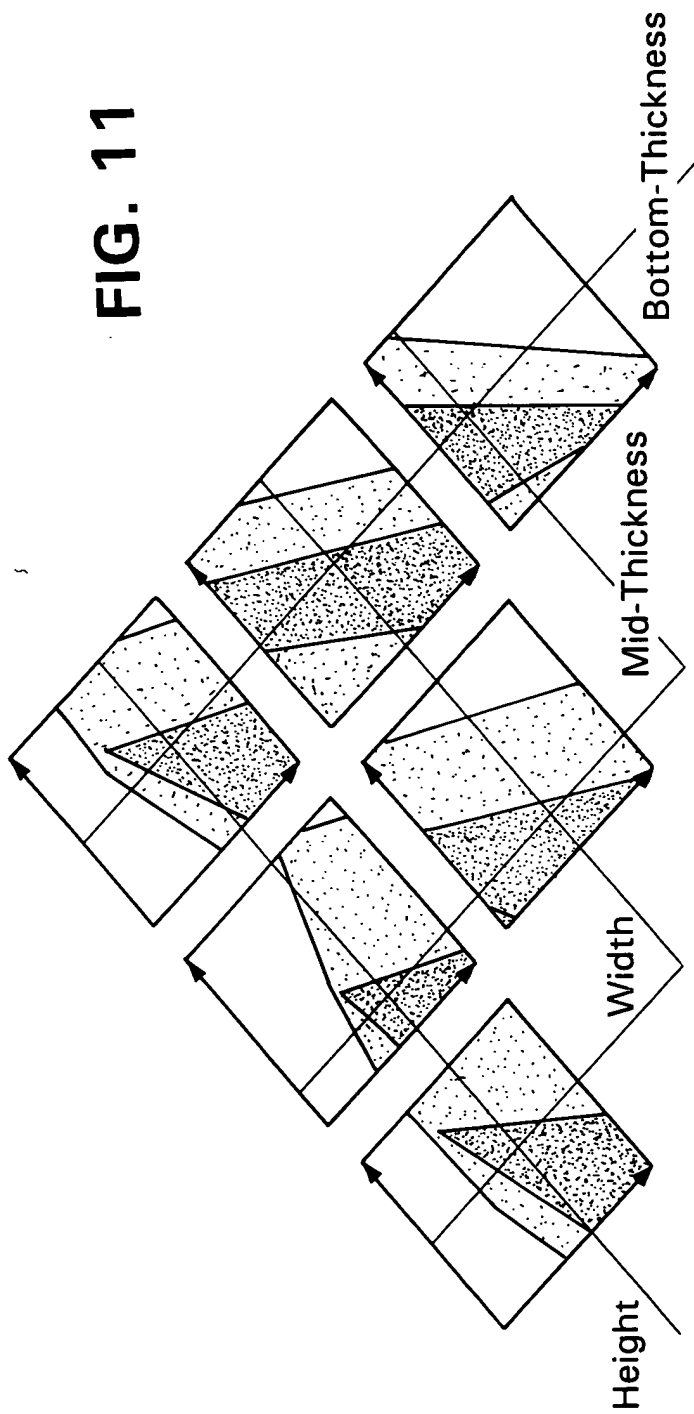


FIG. 11



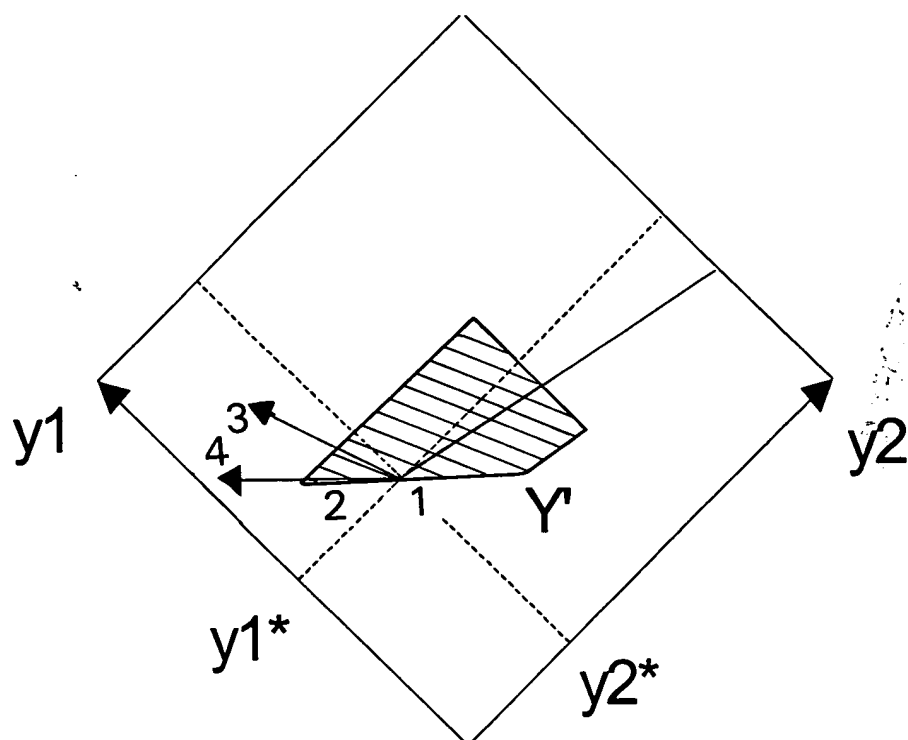


FIG. 12

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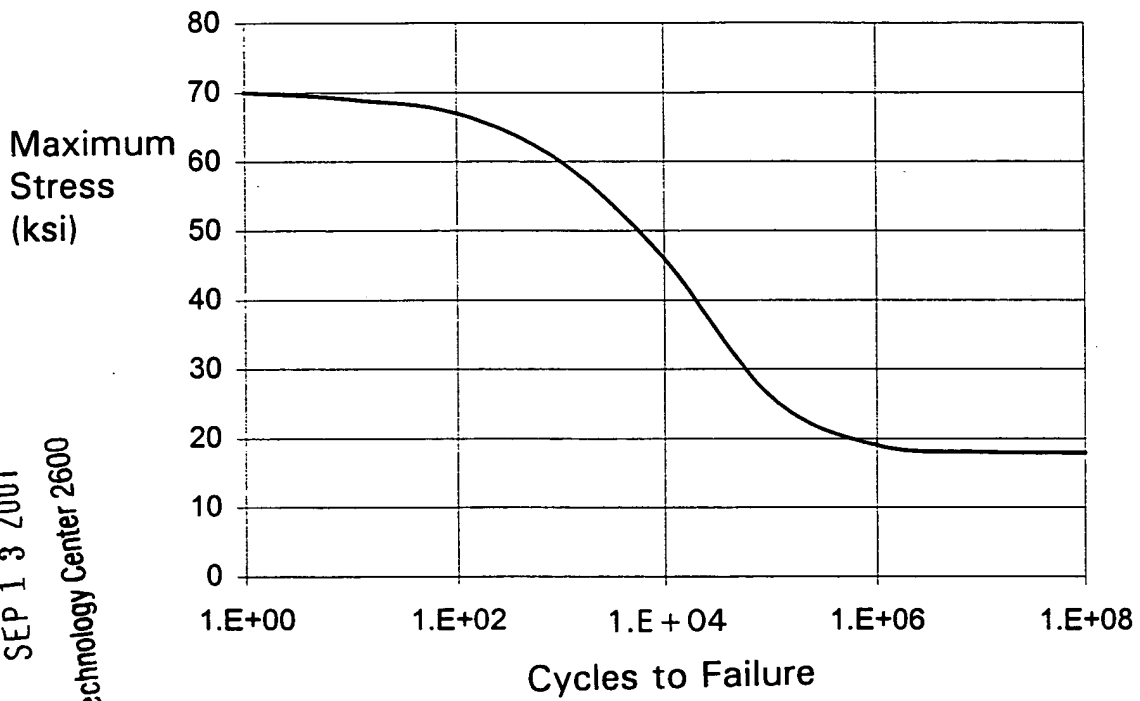
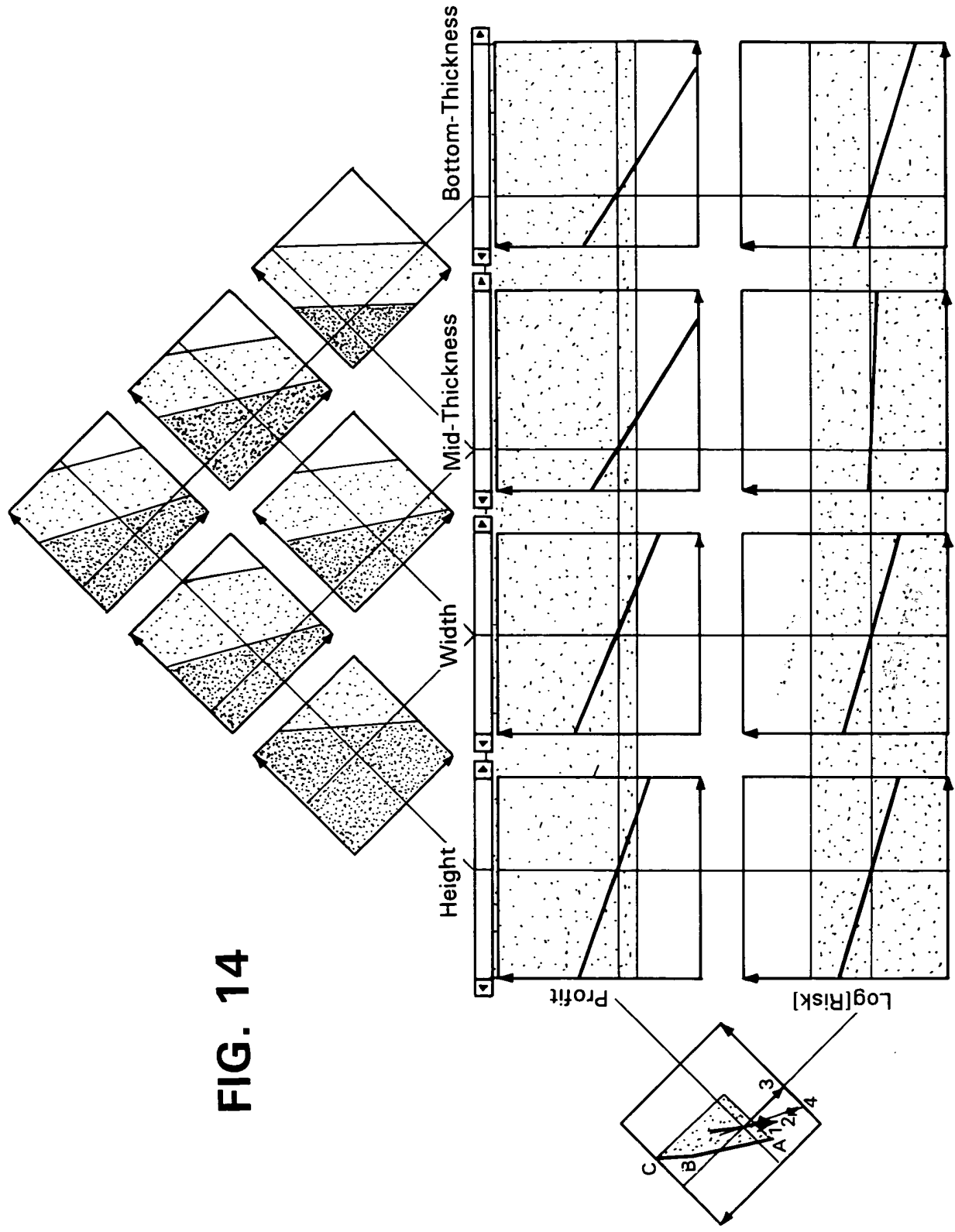


FIG. 13

FIG. 14



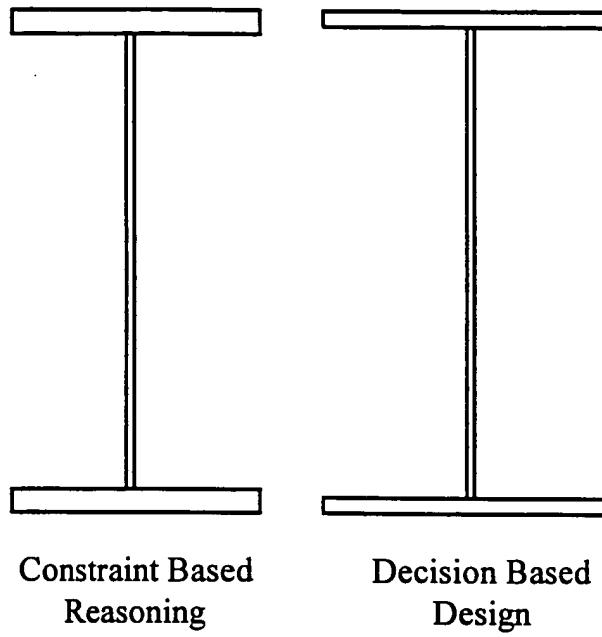


FIG. 15